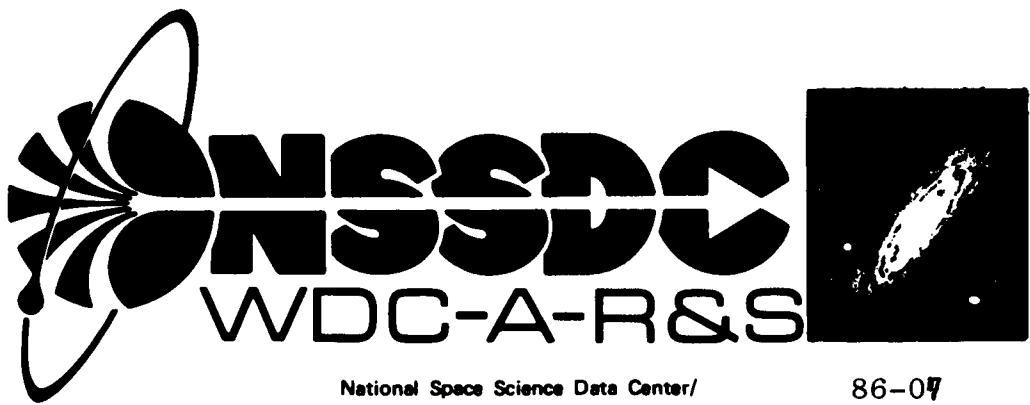


NASA-TM-89685



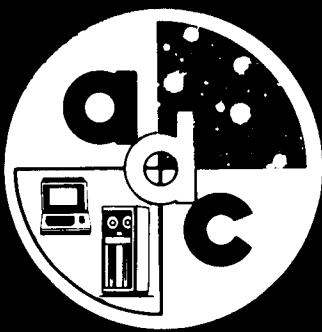
National Space Science Data Center/  
World Data Center A For Rockets and Satellites

86-07

(NASA-TM-89685) DOCUMENTATION FOR THE  
MACHINE-READABLE VERSION OF THE CATALOG OF  
INTERFEROMETRIC MEASUREMENTS OF BINARY STARS  
(MCALISTER AND HARTKOPF, VERSION 1985 JUNE)  
(NASA) 19 p

N90-70517

Unclassified  
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DOCUMENTATION FOR THE MACHINE-READABLE VERSION

OF THE

*Catalog of Interferometric Measurements of Binary Stars*

(McAlister and Hartkopf, Version 1985 June)

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September 1986

National Space Science Data Center (NSSDC)/  
World Data Center A for Rockets and Satellites (WDC-A-R&S)  
National Aeronautics and Space Administration  
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Greenbelt, Maryland 20771

DOCUMENTATION FOR THE MACHINE-READABLE VERSION

OF THE

*Catalog of Interferometric Measurements of Binary Stars*

(McAlister and Hartkopf, Version 1985 June)

ABSTRACT

The machine-readable version of the catalog, as it is currently being distributed from the Astronomical Data Center, is described. The catalog is a compilation of measurements of binary- and multiple-star systems obtained by speckle interferometric techniques. Stars that have been examined for multiplicity with negative results are included, in which case upper limits for the separations are given. The catalog also contains alternate identifications for all systems, epochs of observation, reported errors in position angles and separations, and bibliographical citations.

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## SECTION 1 - INTRODUCTION

The *Catalog of Interferometric Measurements of Binary Stars* (McAlister and Hartkopf 1985) contains all measurements of binary- and multiple-star systems obtained by speckle interferometry (and known to the authors), including negative examinations for duplicity, as of 1985 June. Although the primary data of the compilation are observed separations and position angles, their errors, epochs of measurement, and bibliographical references, ancillary data such as alternate identifications, including designations in the Lick *Index of Visual Double Stars* (IDS, Jeffers *et al.* 1963), are given to facilitate identification of the systems. The compilers of the catalog intend to update it as new observations become available and to issue current versions from time to time.

This document describes the machine-readable version of the *Catalog of Interferometric Measurements of Binary Stars*, Version 1985 June, as it is currently being distributed from the Astronomical Data Center (ADC). It is intended to enable users to read and process the data without problems and guesswork. For additional details concerning the data compilation, users should consult the introductory file of the catalog, which should be printed out or displayed on a terminal and read in any case. A copy of this document should accompany any secondary copy of the machine version originally obtained from the ADC.

### SOURCE REFERENCE

McAlister, H. A. and Hartkopf, W. I. 1985, *Catalog of Interferometric Measurements of Binary Stars*, Version 1985 June (see Center for High Angular Resolution Astronomy, Georgia State University, CHARA Contribution No. 1, 1984).

## SECTION 2 - TAPE CONTENTS

Detailed descriptions of the contents of the *Catalog of Interferometric Measurements of Binary Stars* are given in Tables 1-3. The suggested format can be modified depending upon usage, but care must always be exercised when changing character formats to integer or real. It should also be kept in mind that default values for most A formatted data are blanks and numerically formatted WRITE or PRINT statements will produce zero values.

**Table 1. Tape Contents. Catalog of Interferometric Measurements of Binary Stars, Version 1985 June, Introductory File.**

Byte(s)	Description
1- 80	Introduction and bibliographical references (free text in upper and lower case characters).

**Table 2. Tape Contents. Catalog of Interferometric Measurements of Binary Stars, Version 1985 June, Data File.**

Byte(s)	Units	Suggested format	Default value	Description
1- 9	---	A9	---	ADS number in <i>New General Catalogue of Double Stars</i> (Aitken 1932), HR number in <i>The Bright Star Catalogue</i> (Hoffleit 1982), or DM number in series of Durchmusterung catalogs: Bonner Durchmusterung (Argelander 1859-1862; Kustner 1903) in zones +89° to -1° or its southern extension (Schönfeld 1886) in zones -2° to -22°; Córdoba DM (Thome 1892-1932) in zones -23° to -51°; and Cape Photographic DM (Gill and Kapteyn 1896-1900) in zones -52° to -89°.
10- 11	---	2X	---	Blank
12- 25	---	A14	---	Star name. Common name for system. When available, the Bayer or Flamsteed designation may be used. Three-character abbreviations for Greek letters are used where appropriate.
26	---	1X	---	Blank

Table 2 (continued)

Byte(s)	Units	Suggested format	Default value	Description
27- 28	---	A2	---	The characters "HD" for <i>The Henry Draper Catalogue</i> (Cannon and Pickering 1918 -1924) and <i>The Henry Draper Extension</i> (Cannon 1925-1936, Cannon and Walton Mayall 1949).
29	---	I1X	---	Blank
30- 35	---	I6	---	HD number.
36- 37	---	A1,I1	---	Hyphen (-) followed by the last digit of HD number of companion star, when each binary component has its own HD number.
38	---	I1X	---	Blank
39- 41	---	A3	---	The characters "SAO" for <i>Smithsonian Astrophysical Observatory Star Catalog</i> (SAO Staff 1966).
42	---	I1X	---	Blank
43- 48	---	I6	---	SAO number.
49- 50	---	2X	---	Blank
51- 60	---	A10	---	IDS designation for the system, equinox 2000.0.
51- 52	hours	I2	---	$\alpha$
53- 55	min	I3 (F3.1)	---	$\alpha$
56	---	A1	---	Sign of $\delta$ .
57- 58	$^\circ$	I2	---	$\delta$
59- 60	'	I2	---	$\delta$
61	---	I1X	---	Blank
62	---	A1	---	"n" indicates that notes are included in the remarks file.
63	---	I1X	---	Blank

Table 2 (continued)

Byte(s)	Units	Suggested format	Default value	Description
64	---	A1	---	"**" if this record includes a change from the first edition of the catalog.
65	---	1X	---	Blank
66- 74	years	F9.4	---	Epoch of observations. The precision varies, so trailing byte(s) may be blank.
75- 76	---	2X	---	Blank
77- 81	°	F5.1	blank	Observed position angle. The reported precision varies, so byte 81 may be blank.
82	---	1X	---	Blank
83	---	A1	---	
84- 87	°	F4.1	blank	Error in measurement of the position angle, if it is explicitly given in the source. The precision varies and byte 86 may be blank.
88- 89	---	2X	---	Blank
90	---	A1	---	<" if the angular separation reported is an upper limit.
91- 95	"	F5.3	---	Observed angular separation. The precision varies, with lower precision indicated by blanks in the trailing bytes of the field.
96	---	1X	---	Blank
97	---	A1	---	>" if the error in the angular separation reported is a lower limit.
98-102	"	F5.3	---	Error in the angular separation, if it is explicitly given in the source. The precision varies.
103-104	---	2X	---	Blank

Table 2 (concluded)

Byte(s)	Units	Suggested format	Default value	Description
105-106	---	A2	---	Two-character code for the bibliographic reference. References are given in the introductory file.
107	---	A1	---	"n" indicates that notes are included in the remarks file.
108	---	A1	---	"*" is given only to flag a change from the first edition of this catalog (same as byte 64).

Table 3. Tape Contents. Catalog of Interferometric Measurements of Binary Stars, Version 1985 June, Remarks file.

Byte(s)	Description
1- 80	Notes to the catalog (free text in upper and lower case characters).

### SECTION 3 - TAPE CHARACTERISTICS

The information reported in Table 4 is sufficient for a user to describe the indigenous characteristics of the machine version of the catalog to a computer. Tape parameters that are easily varied among computer installations, such as block size (physical record length), blocking factor (number of logical records per physical record), total number of blocks, tape density, and internal coding (EBCDIC, ASCII, etc.), are not listed here, but should always be transmitted with tape copies of the catalog.

Table 4. Tape Characteristics. Catalog of Interferometric Measurements of  
Binary Stars. Version 1985 June.

NUMBER OF FILES . . . . .	3
LOGICAL RECORD LENGTHS (BYTES) . . . . .	80, 108, 80
RECORD FORMAT . . . . .	FB*
NUMBERS OF LOGICAL RECORDS . . . . .	92, 3564, 5488

\* Fixed block length (last block may be short)

#### SECTION 4 - REMARKS, MODIFICATIONS, ACKNOWLEDGMENTS, AND REFERENCES

The *Catalog of Interferometric Measurements of Binary Stars* was received on magnetic tape from Drs. H. A. McAlister and W. I. Hartkopf of Georgia State University on June 11, 1985. As received, the entire catalog was contained in a single tape file, which had been formatted to produce the printed version. In order to make the data file homogeneous and fully processable by computer, the introduction (including references) and notes were separated from the data and placed into individual text files, and the data file was edited and computer processed to prepare a uniform data set. The data processing included the restructuring of all data records so that each observation contains the full complement of identifications. This allows for searches to retrieve single records giving all information relevant to a system and for sorting the entire file by any one of the data fields contained in the individual observations. This format also makes it possible to update the catalog by preparing a separate file of new observations in the same format, then merging the new file into the old one by simply including the new data and resorting the entire data file. The reformatting included the right justification of all catalog identifications previously left justified and the addition of the digits "19" to complete the full representation of each epoch of observation. The logical record length was expanded to allow for increased precision in certain data fields, as recommended by Dr. Hartkopf. In general, the data file was formatted to uniformly accommodate each data field in the present catalog and to allow for potential changes in future editions.

#### ACKNOWLEDGMENTS

Appreciation is expressed to Drs. Hal McAlister and Bill Hartkopf for supplying the *Catalog of Interferometric Measurements of Binary Stars* on magnetic tape. Dr. Hartkopf also responded to initial inquiries concerning the reformatting of the data file and provided information about the increase in precision for epoch and position angle in future editions of the machine version. In addition, the compilers kindly reviewed a preliminary copy of this document, offering comments and suggestions. They have also agreed to consider adoption of the standardized format for future editions of the catalog to preclude the extensive modifications required to produce the present machine version. This cooperation is greatly appreciated and will ensure that future editions of this valuable compilation will become available for distribution to the scientific community soon after completion.

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- Thome, J. M. 1892-1932, *Córdoba Durchmusterung, Resultados del Observatorio Nacional Argentino* 16 (1892, Part I: -22° to -32°), 17 (1894, Part II: -32° to -42°), 18 (1900, Part III: -42° to -52°), 21 (Part I) (1914, Part IV, -52° to -62°), 21 (Part II) (1932, Part V: -62° to -90°).

## SECTION 5 - SAMPLE LISTING

The sample listings given on the following pages contain logical data records exactly as they are recorded on the tape. Groups of records from the beginning and end of each file are illustrated. The beginning of each record and the bytes within the record are indicated by the column heading index across the top of each page (digits read vertically).

**LISTING OF RECORDS FROM TAPE FILE**

TAPE FILE NAME: Interf Meas Bin: Introd

1	CATALOG OF INTERFEROMETRIC MEASUREMENTS OF BINARY STARS	
2		
3	Harold A. McAlister and William I. Hartkopf	
4		
5	Center for High Angular Resolution Astronomy	
6	Georgia State University	
7	Atlanta, Georgia 30303 U.S.A.	
8		
9	CHARA Contribution No. 1	
10	January 1984	
11	(revised June 1985)	
12		
13		
14	This catalog includes all measures of binary- and multiple-star	
15	systems obtained by speckle interferometry, as well as negative examinations	
16	for duplicity, as of June 1985. The entries for each binary star system	
17	include an identification line containing self-explanatory designations from	
18	other catalogs. The coordinates are given in the form of the IDs designa-	
19	tion (equinox 2000). HD and SAO numbers are always given where available.	
20	Epochs are uniformly given as the fraction of the Besselian year even though	

LISTING OF RECORDS FROM TAPE FILE

**TAPE FILE NAME:** Interf Meas Bin, Introd.  
**RECORDS** 106 TO 125  
**TAPE FILE** 7  
**RECORD LENGTH** 80 BYTES  
**INPUT VOLSER** ADC006

**LISTING OF RECORDS FROM TAPE FILE**

TAPE FILE NAME: Interf Meas Bin. Data

RECORDS

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IAFE FILE 8

RECORD LENGTH 108 BYTES

INPUT VOL SER ADC006

RECORD	1	-03	5750	HD	224945	SAO	147045	00020-0246	1981.703	<0.030	N3
RECORD	2	ADS	17175	Bu	733 AB	HD	224930	SAO	91669	00020+2706	1973.789
RECORD	3	ADS	17175	Bu	733 AB	HD	224930	SAO	91669	00020+2706	1974.650
RECORD	4	ADS	17175	Bu	733 AB	HD	224930	SAO	91669	00020+2706	1976.6138
RECORD	5	ADS	17175	Bu	733 AB	HD	224930	SAO	91669	00020+2706	1976.6165
RECORD	6	ADS	17175	Bu	733 AB	HD	224930	SAO	91669	00020+2706	1976.8596
RECORD	7	ADS	17175	Bu	733 AB	HD	224930	SAO	91669	00020+2706	218.9
RECORD	8	ADS	32	STF	3056 AB	HD	225220	SAO	53617	00046+3416	1977.797
RECORD	9	ADS	61	STF	3062 AB	HD	123	SAO	21085	00061+5826	1980.7177
RECORD	10	ADS	61	STF	3062 AB	HD	123	SAO	21085	00061+5826	1980.919
RECORD	11	ADS	61	STF	3062 AB	HD	123	SAO	21085	00061+5826	1981.6981
RECORD	12		+64	0003	HD	443	SAO	11005	00091+6505	110.0	<0.033
RECORD	13		+64	0003	HD	443	SAO	11005	00091+6505	1975.7128	<0.033
RECORD	14		+64	0003	HD	443	SAO	11005	00091+6505	1976.8596	<0.035
RECORD	15		+64	0003	HD	443	SAO	11005	00091+6505	1976.9225	<0.035
RECORD	16	ADS	102	STF	2	HD	431	SAO	4048	00093+7943	1978.6180
RECORD	17	ADS	102	STF	2	HD	431	SAO	4048	00093+7943	1980.7203
RECORD	18	ADS	102	STF	2	HD	431	SAO	4048	00093+7943	1980.7260
RECORD	19	ADS	102	STF	2	HD	431	SAO	4048	00093+7943	1980.8816
RECORD	20	ADS	102	STF	2	HD	431	SAO	4048	00093+7943	1980.913

**LISTING OF RECORDS FROM TAPE FILE**

```

TAPE FILE NAME: Interf Meas Bin, Data
      RECORDS    5514 TO    5533
      TAPE FILE          8
      RECORD LENGTH     108 BYTES
      INPUT VOLSER      ADC006

```

**LISTING OF RECORDS FROM TAPE FILE**

TAPE FILE NAME: Interf Meas Bin, Notes

RECORDS 1 TO 20

TAPE FILE C

RECORD FLOWERS

330

**NOTES TO THE CATALOG  
RECORD**

RECORD 2

7 DECONP

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The quoted separation is a vector separation along

RECURV 6 the given position angle.

7

RECORD 8 00173+0852 = ADS 238

The measure reported in A6 for 76 6220 is contained in record 9.

RECORD 18 and has been omitted from this section.

RECORD 11

BECOBID 12 00293 20030 - קי 100

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11

16 SECURE /9:5326: This measure was incorrectly attributed

RECORD 17 : to ADS 2200 in A7.

RECORD 18

RECORD 19 00416+2438 = HR 178  
RECORD 20 83.9362: According to FA. this (and numerous

## LISTING OF RECORDS FROM TAPE FILE

TAPE FILE NAME: Interf Meas Bid: Notes

RECORDS 422 TO 441

TABLE ELEVEN

תורת הרים ותורת נחלים

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RECORD 422 22590+4213 in paper A6: the correct position is

RECORD 423 2258046213

REF ID: BDN

RECORD 62E 23052-0362 = NDS 16603

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the specificities of the secretory system/interferonergic activity

RECORD 433 is given by McAllister and Hartkopf (P.A.S.P. 94:

RECURSUS 434 832, | 9882).

RECOM 435 71.6350: This epoch was incorrectly given as

RECORD 436 77.6359 in A6.

RECORD 437

RECORD 438 23460+4625 = HR 9003

RECORD 439 77-9135: This measure was omitted in A6.

RECORD 440 It is not established whether the third component